Surface Soil Moisture: toward a new combined dataset
to maximize the use of satellite data


Contact: william.moutier@meteo.be

Introduction

The Surface Soil moisture (SSM) being an essential climat variable, it is fundamental to get homogeneous long term time series and catch both long and natural or human induced short-scale trends of SSM to improve predictions of the climate trajectory. The objective of this study is to take advantage of different approaches deriving the SSM by using the more appropriate dataset according the land cover. For this purpose, 3 datasets were used: the European Spatial Agency Climate Change Initiative (ESA-CCI) SSM ([1]), the ECMWF’s fifth reanalysis (ERA-5; [2]) and a recent method from Ghilain et al., in prep ([3]) deriving the SSM from the land surface temperature data estimated thanks to thermal infrared sensors aboard geostationary satellites.

Soil Moisture product : New combined approach

**REGIONAL PRODUCT SELECTION**

Leaf Area Index (LAI)

- Clustering (kmeans) using the LAI / Climate informations
- Associate each cluster to a specific product according to the statistic
- Identify the best product according to the station

**GAP FILLING APPROACH**

Comparison with scaled In-Situ SM and identification of valid stations (R > 0.6 and MAD < 0.2)

- 52 selected

**Typical example of potential application**

**Greater example of potential application**

**New CM SAF TDCR 1983–2020**

- Sensible & Latent heat fluxes
- Hourly, daily and monthly data
- Meteosat FOV / ~5km of resolution

**Why the new combined product?**

2. Maximize the use of satellite data which could prevent dependence of model output.

**References**


Acknowledgement: This research is funded by EU/ETESAT (SAF/CM/DWD/CDOFS/CosA) and PRODEX [400023961] “Belgian contribution to the Satellite Application facility on Climate Monitoring (B-CMSAF)”. 